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BEYOND INCOME AND WEALTH

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This paper proposes four criteria for the selection of a better measure of living standards: it should be comprehensive, correlation sensitive, preference based, and fairness based. These criteria are applied to the following measures: income, equivalent income, capabilities, and satisfaction. The paper then explores the relationship between the space of goods and services, the space of budgets, and the more fundamental space of the aspects of life that people really care about. The importance of the fairness principles guiding interpersonal comparisons is highlighted.

1. FOUR CRITERIA FOR A SOCIALLY RELEVANT MEASURE OF WELL-BEING

There is now a consensus that income and wealth are insufficient measures of well-being for the purpose of the evaluation of social welfare, inequalities and poverty. There are other dimensions that are important in people's eyes, such as health and social status. Many authors and institutions have now advocated a broader assessment of well-being and concrete efforts are made by statistical institutes to enrich their list of indicators. But there is no consensus about how to construct a comprehensive measure.

In this paper, I propose to examine possible measures with the following four criteria:

1. Comprehensive: The measure should, in principle, be able to include many dimensions of life—even if data and practical impediments may make it hard to add more than a few dimensions.
2. Correlation sensitive: The measure should be sensitive to the accumulation of disadvantages on the poorest members of the population. They are not

just poor in monetary terms, but also suffer from additional disadvantages. More generally, the measure should take account of the correlation between advantages and disadvantages across dimensions.

3. Preference based: The measure should rely on the population preferences, allowing for heterogeneity in the relative importance of the various dimensions for different people. Of course, as in the case of comprehensiveness, practical implementation may make it hard to account for the full range of heterogeneity.

4. Fairness based: For the evaluation of social welfare, inequalities and poverty, one is not interested in a purely empirical notion of well-being. Identifying the privileged and the disadvantaged requires interpersonal comparisons that are relevant for determining social priorities. Fairness principles are needed for this task. While there are many different ways of defining fairness, this criterion will nevertheless eliminate the measures that have no backing from any fairness view in circulation.

Before examining alternative measures, it is worth gauging income and wealth at the bar of these criteria. They are somewhat *comprehensive*, as they incorporate all the dimensions of market production and consumption that individuals engage in, including over several periods of time when wealth is considered. But of course, they fail to register many non-market aspects of life, and to this extent they are not sufficiently comprehensive.

Similarly, they remarkably record the *correlation* between market aspects. Those who have less or lower-quality food also have worse housing, jobs with lower pay, less vacations, and so on. But, due to the ignorance of non-market dimensions, the correlation between monetary success and non-market advantages is not taken into account.

Looking at income or wealth rather than the full vector of consumption and production activities is a way of respecting *preferences*, because when prices are identical between two compared situations, income or wealth (or the value of expenditures) provide an accurate account of the preference ranking of these two situations. However, when prices vary across situations, typical price indices lose track of preference orderings, and the heterogeneity of preferences is completely ignored when the same price deflator is used for all the population. Obviously, preferences over non-market aspects of life, and the tradeoffs between such aspects and market achievements, are simply ignored.

Finally, *fairness* considerations can provide a rationale for looking at income and wealth. John Rawls (1971) counted income and wealth as one dimension of the "social primary goods," on the grounds that it is not the business of social policy to look at the details of individuals' market activities or at how they transform their life into a level of subjective satisfaction. Individuals should be left alone in their particular choice of the "good life," and income and wealth provide a reasonable index of their possibilities, in a division of labor whereby social institutions provide all-purpose resources and individuals assume responsibility for their specific goals and way of life.

In conclusion, it is striking that income and wealth do not fare so badly with respect to the four criteria. In a sense, their main drawback is their focus on the market rather than their basic construction. If life consisted only of market-related

activities, one could imagine that income and wealth would appear as reasonable measures of advantage. Fortunately, life is richer and more complex than buying and sellings goods and services, but unfortunately, this creates the need for alternative measures which are not so readily available and are likely to generate more controversy and more difficulties in measurement.

2. From Income and Wealth to Equivalent Income

Given that income and wealth enjoy some promising features, just falling short of satisfying the criteria fully, it is natural to seek to extend them rather than throw them away. There is, however, one worrying point regarding preferences. Even in a world confined to markets, standard monetary measures using uniform price deflators (such the Laspeyres, Paasche, Fisher indexes) cannot respect individual preferences when prices vary across the situations that are covered by the analysis.

Samuelson (1974) has proposed the money-metric utility as a way of overcoming this difficulty. The idea is to fix a reference price vector and move to a world in which this uniform price vector prevails in all situations. In such a world, income and wealth do provide accurate indexes and no deflator is needed. Now, the link between this hypothetical world and the real world is made simply by computing the "equivalent income" (or wealth) that, under the reference price, would give everyone her real world utility. If $v_i(y_i, p_i)$ denotes the indirect utility obtained by individual i with income y_i under the local prices p_i (in the real world), then the equivalent income (or money-metric utility) is simply the solution y_i^* to the equation:

$$v_i(y_i, p_i) = v_i(y_i^*, p^*),$$

where p^* is the reference price vector. Note that, under standard monotonic preferences, y_i^* is increasing with $v_i(y_i, p_i)$, and therefore is itself a utility representation of i's preferences. As equivalent income can, in an intertemporal setting, be a permanent income providing the same indirect utility as actual wealth, one sees that the notion of equivalent wealth is not needed for capturing intertemporal aspects.

This new measure of income is arguably just as good as actual income regarding the criteria of a comprehensive, correlation-sensitive, and fairness-based measure, and is clearly better as far as respecting preferences is concerned. Actually, it even displays an interesting property. Consider two individuals who have identical preferences but different situations (or it can be the same individual at different periods of her life, provided her preferences remain unchanged). They always agree about who is better off if they only look at their market situation, and the equivalent income approach concurs with them, because it always deems that an indifference curve that is higher corresponds to a greater value of the equivalent income. Decancq *et al.* (2015a) and Fleurbaey and Blanchet (2013) call this the "same-preference principle":

Same-preference principle: Two individual situations associated with the same preference orderings should be ranked in the same way as done by this common preference ordering.

One may perhaps question whether equivalent income is really as good as actual income for the fairness criterion. Actual income and wealth do describe real possibilities, whereas equivalent income describes hypothetical budget sets which are seen as equally good by individuals, but no longer capture what individuals can actually do. However, they still describe the same sort of possibilities in the same space of budgets, so that the thrust of the interest in budgets appears to carry over to the new measure, as argued, for instance, by Deaton and Muellbauer (1980) and Thomson (1994).

The money-metric utility has been the topic of many debates and criticisms. A detailed analysis of these controversies can be found in Fleurbaey and Blanchet (2013). The bottom line is that none of the criticisms that have been raised against this measure is decisive. In particular, the criticism that the choice of the reference $p*$ is "arbitrary" is invalid. The choice of $p*$ involves considerations of equal access to various lifestyles as well as proximity to the market situations experienced by the population and minimization of the Gershenkron effect.[1] For details, see Fleurbaey and Blanchet (2013) as well as Decancq et al. (2015b).

The main point of this section is the following. Once equivalent income is adopted in order to take care of the heterogeneity of prices across individual situations, why not extend this to other aspects of the individuals' environment and personal situation? One can define an indirect utility that takes account of non-market aspects of life, q_i, and define an extended equivalent income by fixing a reference vector $q*$ along the reference price $p*$, and computing the solution y_i^* to the equation:

$$v_i(y_i, p_i, q_i) = v_i(y_i^*, p*, q*).$$

This equivalent income is the level of income that would yield the current satisfaction $v_i(y_i, p_i, q_i)$ if it were associated to the reference vectors $(p*, q*)$.

To illustrate, imagine that the indirect utility function takes the following form (that is now familiar in happiness studies):

$$v_i(y_i, p_i, q_i) = \ln \frac{y_i}{d_i(p_i)} + \sum_s \varphi_{is}(q_{is}),$$

where $d_i(p_i)$ is a deflator respecting i's preferences and $\varphi_{is}(q_{is})$ is the utility brought by dimension s of the vector q_i. One then computes equivalent income as the solution to

$$\ln \frac{y_i^*}{d_i(p*)} = \ln \frac{y_i}{d_i(p_i)} + \sum_s (\varphi_{is}(q_{is}) - \varphi_{is}(q_s^*)),$$

where the corrections to deflated income are transparently made for the deviations of q_i from $q*$ in its various dimensions. One finally obtains that equivalent income is equal to ordinary income multiplied by a list of correction factors:

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[1]The Gershenkron effect has to do with the fact that the greater the difference between $p*$ and p_i, the more $p*x_i$ (where x_i is the consumption vector) overestimates y_i^*.

$$y_i^* = y_i \frac{d_i(p^*)}{d_i(p_i)} \prod_s e^{(\varphi_{is}(q_{is}) - \varphi_{is}(q_s^*))}.$$

This extension to non-market dimensions has been proposed in particular by Hammond (1994). It may seem natural to take an average or median value for each component of q^* as a way to minimize the distance between people's situations and the reference. However, Fleurbaey and Blanchet (2013) explore other possibilities than taking one fixed reference vector q^*. First, they note that one could actually pick a list of possible references q_k^*, for $k = 1, \ldots, K$, and compute the weighted sum

$$\sum_k \alpha_k y_{ik}^*,$$

where each y_{ik}^*, $k = 1, \ldots, K$, would be the solution of the equation:

$$v_i(y_i, p_i, q_i) = v_i(y_{ik}^*, p^*, q_k^*).$$

A weighted sum of utilities being still a utility, this provides a new measure that takes account of various possible references simultaneously. This can be viewed as convenient when the choice of the reference vector q^* is not obvious.

Another possibility is to let q^* be chosen by the individual (at no cost), so that one would have

$$v_i(y_i, p_i, q_i) = \max_{q^*} v_i(y_i^*, p^*, q^*).$$

This nicely let individual preferences govern the choice of the reference q^*, since different individuals may end up picking different values of q^*—without jeopardizing the satisfaction of the same-preference principle, interestingly. Another rationale for this particular measure is that it provides the lowest possible value of y_i^* for all values of q^*, therefore the most pessimistic (i.e., charitable) evaluation of each individual's situation.

Let us now examine how these extended notions of equivalent income fare with respect to the criteria of evaluation offered in the first section. *Comprehensiveness* can be achieved fully in principle. The vector q can include all the non-market aspects of life, including the most spiritual and intimate. Now, one may frown at the idea that everything is monetized by this approach. But monetization is fully controlled here by individual preferences. If an individual cares a lot about a non-market of life, this will make her look miserable if she is far from her preferred achievement for this dimension (according to the latest measure proposed here).

Correlation of disadvantages is correctly recorded by this approach. The equivalent income is lower when actual income is lower but also when other non-market disadvantages accumulate and compound one another. Moreover, the role of correlation will be monitored by the degree of complementarity or substi-

tutability of the various dimensions. In the case of strong complementarity, a single disadvantage means a lot, whereas in the case of strong substitutability, the disadvantages are more additive. This makes quite a difference to the evaluation of situations and it appears important to follow individual preferences in this respect.

The measure is clearly *preference-based*, as the equivalent income is a utility function. One may worry that it in fact relies too much on individual preferences, which are often unreliable and inconsistent. Behavioral economics is now casting doubt on the idea that individual preferences can be used reliably. However, it does not eliminate the idea that some core preferences are more or less stable and robust to framing, or, at least, that under suitable conditions of deliberation individuals would form reliable preferences. The fact that ordinary choices and stated preferences do not meet these conditions of ideal deliberation is worrisome in practice, but does not impugn the value of constructing a theoretical approach that could make use of reliable preferences if these could be elicited.

Fairness is perhaps less obvious a priori. But the theory of fair social orderings (as synthetized by Fleurbaey and Maniquet 2011) does provide many arguments in favor of the "equivalence approach," which is the general approach of evaluating actual situations by Pareto-equivalent hypothetical situations which are simpler for the application of basic principles. If one accepts the idea that when all individuals enjoy the reference vector q^* (or q_i^*, when it is personalized), it is reasonable to compare them in terms of income, the extension of equivalent income to non-market dimensions appears vindicated.

In conclusion, the extended equivalent income appears an attractive way of extending income and wealth to non-market aspects of life. It may be hard to implement in practice, because it requires data on multidimensional individual situations coupled with estimations of individual preferences. Note that it would actually be possible to directly ask the "equivalent income" question: "What amount of income would be sufficient for you to maintain your current satisfaction if you faced the prices p^* and enjoyed the non-market situation q^* (or: the non-market situation of your choice)?" This is cognitively very hard, though it has been done for the case of fixed prices and one non-market dimension (health) in Fleurbaey *et al.* (2013). The enormous advantage of asking the direct "equivalent income" question is that it yields a distribution of equivalent incomes in the population that tracks the full heterogeneity of preferences. In contrast, the methods that estimate preferences from observed behavior, from simpler stated-preference questions, or from life satisfaction questions, are only able to estimate the average preferences of socio-demographic subgroups.

3. Capabilities, a More Abstract Generalization of Income and Wealth

The idea of extending the income–wealth approach by the notion of equivalent income is not the only possibility when one seeks to build on the good features of income and wealth. Another prominent proposal is Amartya Sen's capability approach. A capability set is indeed a generalization of the budget set, and includes all dimensions of life that the individuals have "reasons to value." A capability set is the set of all combinations of functionings to which an individual has access. Just

like an individual can choose a consumption–labor bundle in her budget set, one can imagine that the individual chooses a vector of functionings (like nutrition, health, education, social relations, travel) from her capability set.

There are ways of developing the capability approach that make it quite promising in terms of the four criteria introduced in this paper. It is clear especially that a measure of capabilities can be *comprehensive*, sensitive to *correlations* and related to *fairness* ideas. In particular, regarding the last criterion, capability sets can be viewed as a particular embodiment of the notion of opportunity set that has become popular in political philosophy after Dworkin (2000), Arneson (1989), and Cohen (1989), with applications in economics developed by Roemer (1998), among others, and critically discussed in Fleurbaey (2008).

It is well known that the Human Development Index (HDI) is not very satisfactory as an implementation of the capability approach, and it does not satisfy the criteria very well, due to its limitation to a few dimensions, its additively (or, lately, multiplicatively) separable structure that is impervious to correlations and accumulation of disadvantages on the poor, and its lack of connection to population preferences and fairness theories. But the HDI is a pragmatic compromise that puts all priority to the possibility of computing the measure for all countries, at the cost of being unable to track many dimensions and their correlations. Let us focus here on capability theory, which can be given better applications in the future when data permit.

The "*preference-based*" criterion is more contentious in the capability tradition. Connecting the measure of capabilities to individual preferences could be done with the equivalence approach introduced in the previous section, or a similar method. But the advocates of the approach, in particular Sen and Nussbaum, have been quite reluctant to incorporate individual preferences. Nussbaum (2000) focuses on basic capabilities and argues that they should be made available to everyone independently of preferences. This is indeed arguable for basic capabilities, but it says little about what should happen beyond the basic levels guaranteed to all. Sen (1985, 1999) argues that weighting the various dimensions of capabilities involves value judgments rather than personal tastes, and therefore should more appropriately be discussed in the public arena at the level of communities. This leaves little room for variations of preferences within communities, and nothing is said about the comparability of different weighting schemes and measures across communities. More importantly, it seems to involve quite a departure from Rawls' view that conceptions of the good life are personal and should be left free at the individual level.

When the diversity of individual views is acknowledged in Sen's approach, it is recommended to seek cases of consensus rather than try to aggregate preferences. That is, if the situation of individual i is considered better than j's situation by all relevant members of the community, then one should consider that this is a firm evaluation. Sen calls it the "intersection principle" (by reference to the intersection of individual preference relations). In this way one obtains a partial ranking of individual situations. Unfortunately, as discussed at length in Fleurbaey and Blanchet (2013), this partial ranking is not compatible with respecting individual preferences for intrapersonal comparisons. Indeed, it may happen that i and j are both indifferent between two allocations x and y, but that i's

TABLE 1
PROBLEM WITH THE INTERSECTION PRINCIPLE

	Athlete	Banker
Allocation x	high health, low income	high health + ε, low income + ε
Allocation y	low health + ε, high income + ε	low health, high income

situation dominates j's in x whereas the opposite occurs in y. This occurs when their indifference curves cross between x and y.

To give a concrete example, consider an athlete and a banker in the situations presented in Table 1.

Because the athlete values health more than income, she may be indifferent between x and y, even though she dominates the banker in y and is dominated in x; and conversely for the banker. Who is better off? If one declares that the dominating individual is better off in both allocations (the banker in x and the athlete in y), in accordance with the intersection principle (after all, everyone agrees that the banker has a better bundle than the athlete in x and the athlete has a better bundle than the banker in y), this clashes with their own preferences because they are indifferent between the two allocations.

As argued in Fleurbaey and Blanchet (2013), the problem with the intersection principle is that it focuses on the comparison of individual bundles, whereas the relevant objects to be compared are pairs of bundles and preferences. How well-off an individual is depends not only on her objective functionings or capabilities, but also on the fit between this objective situation and the individual's preferences. A bundle that is better in all respects may be associated with less fitting preferences: a banker that is slightly richer and healthier than an athlete may actually be worse off, if the mix of wealth and health in her situation contains too much health and not enough wealth to her taste. Therefore, the partial ranking produced by the intersection principle is not actually a good starting point for the construction of reasonable interpersonal comparisons. One can claim that any reasonable set of interpersonal comparisons will disagree with the intersection principle in some cases, when individual preferences are sufficiently diverse.

Of course, by granting capability sets to individuals rather than monitoring their achievements, one can hope that the capability approach will not impose too much on individuals' lifestyles. The idea is that even if capability sets are evaluated with a uniform rod, they are sets from which individuals with different goals in life can choose different options in functionings. But overall, this seems a sort of second best compared to the following alternative approach. First, individual preferences about personal lifestyle should be respected to the greatest possible extent (provided they are morally respectable, of course). This implies that weighting coefficients should be individual specific in the ideal measure. Second, it is questionable to focus on opportunity sets when individuals care about their achievements. The capability approach fetishizes choice and freedom when putting the spotlight on capabilities, while paying little respect to the diversity of individual preferences and to the fact that individuals care not only about their opportunities but also about their achievements. The true freedom is not to be given an oppor-

tunity set filled with options that are ignorant of one's personal preferences, but rather, to be given a mix of opportunities and achievements that cater to one's authentic wishes.

In conclusion, the capability approach, in the formulation proposed by Sen and Nussbaum, does not seem sufficiently promising in terms of the "preference-based" criterion. This is a defect that can be remedied along the lines suggested above, because the example of equivalent income proves that it is possible to design measures that respect individual preferences while providing reasonable interpersonal comparisons.

Another point deserves emphasis here. Compared to the equivalent income method, one interesting feature of the capability approach is its very general form, that refers to all sorts of "functionings," that is, states and actions of individuals, without specific reference to income and wealth. A drawback of the measures that rely on the monetary metric (like income or equivalent income) is that they depend on particular institutions, and may not work well across societies with very different institutions, in particular, different boundaries of market transactions. In contrast, an abstract description of individual situations in terms of functionings can be quite independent of the particular institutions that surround them.

This discussion suggests that it would be nice to explore an extension of the income–wealth approach that is like the more abstract and institution-independent capability approach but is as respectful of individual preferences as the equivalent income approach. This idea is examined in the remainder of this paper.

4. Happiness, a Direct Comprehensive Measure?

The recent development of happiness studies is interpreted by some authors (e.g., Layard, 2005; Dolan, 2014) as providing just that: a measure that goes to the heart of well-being and respects individuals' perspectives on life. Satisfaction surveys ask respondents questions like the following: "How satisfied are you with your life as a whole these days?" Respondents have to provide a numerical answer on a given scale (e.g., from 0 to 10) or a categorical answer (from "very satisfied" to "not at all satisfied").

Let us examine how the satisfaction scores that can be constructed with such surveys behave in front of the four criteria used in this paper. The approach is clearly *comprehensive*, since it refers to life "as a whole," thereby making it possible and actually easy for each respondent to incorporate all relevant dimensions of life in the answer.

Similarly, *correlations* between (dis)advantages are automatically recorded by the respondents when they assess their whole situation. It is informationally extremely efficient to cover all aspects of life in a single, short question that takes only a few seconds to answer. Such informational efficiency is a very attractive feature of these surveys, because they can be administered at a low cost in all countries of the world.

It may seem that the satisfaction scores are also most directly *preference-based*, since the respondents themselves get to choose the weights they want to assign the various dimensions of life that they review when answering the question. Unfortunately, the situation is complex because the answers have to be put in the

numerical or categorical scale of the question, and if different respondents (or the same respondent at different times) use the scales differently, the link between people's objective situations and their answers may be impossible to track.

The clearest way to describe the problem is that the same-preference principle is not satisfied by satisfaction scores. Two individuals may share the same preference ordering, and evaluate their situations with the same ranking, but the order of their answers to the satisfaction question may be reversed if they use the scales in different ways. If one says "7" and the other says "8," it is impossible to infer that both consider the latter's situation to be better than the former's. It may be the opposite in the case in which the former is more difficult to satisfy than the latter due to her past history or to the comparison with different reference groups.

This means that the distribution of satisfaction in the population, as observed from these surveys, may tell us a mixed story that combines genuine information about their relative advantages and disadvantages together with noise coming from their different uses of the scale. The worst-off then gather genuinely disadvantaged people with disgruntled advantaged people, and the better-off gather genuinely privileged people with stoic individuals who put a bright face on their ordeals. Empirical studies of the distribution of satisfaction and the distribution of more objective indexes (including equivalent income) in Decancq *et al.* (2015a) and Decancq and Neumann (2015) confirm that there is a low correlation and that subjective satisfaction appears very noisy. This problem has also been highlighted by Graham (2009).

This is obviously a complex matter because there are many unobserved dimensions of life in the more objective indexes. The satisfaction scores have the good feature of incorporating all unobserved but genuine disadvantages, but unfortunately they necessarily smuggle in the noise generated by heterogeneous uses of the answer scale by the respondents. With the available data, it is impossible to be sure of what effect contributes most to the low correlation between subjective satisfaction and more objective measures. This is a very interesting issue for future research, which can be explored both by expanding the observations on dimensions of life in the objective measures and by reformulating satisfaction questions so as to minimize the noise in the scales.

To explain this issue in more concrete terms, consider the following typical satisfaction regression:

$$S_i = \alpha \ln y_i + \sum_s \beta_s q_{is} + \sum_{s,k} \delta_{sk} q_{is} z_{ik} + \sum_k \gamma_t z_{ik} + \varepsilon_i,$$

where y_i is real income, q_{is} depict quality of life in various dimensions, z_{ik} are socio-demographic variables and ε_i is the residual. This residual contains both unobserved quality of life variables and some noise due to the fact that, controlling for socio-demographic characteristics, respondents do not use the scale uniformly. When a measure like equivalent income focuses on the part of the equation that contains income and observed quality of life, $\alpha \ln y_i + \sum_s \beta_s q_{is} + \sum_{s,k} \delta_{sk} q_{is} z_{ik}$, in order to compute

$$y_i^* = y_i \prod_s e^{(\beta_s + \sum_k \delta_{sk} z_{ik})(q_{is} - q_s^*)},$$

it is tempting to look at S_i as a more comprehensive measure because ε_i also contains other quality of life effects. Unfortunately, one cannot use

$$\alpha \ln y_i + \sum_s \beta_s q_{is} + \sum_{s,k} \delta_{sk} q_{is} z_{ik} + \varepsilon_i$$

as a directly comparable index because ε_i is also incorporating undesirable noise that is imperfectly eliminated by the socio-demographic controls.

These difficulties also connect directly to the criterion of *fairness*. Long before happiness studies became popular in economics, Sen (1985) rejected subjective satisfaction as a measure of advantage on the grounds that it is too indirectly linked to people's objective conditions. Disadvantaged people who put up with their difficulties can achieve a high level of satisfaction but this does not justify letting them down in social policies. Other authors like Dworkin (2000) have focused on the other extreme, and questioned the apparent disadvantage of those who are dissatisfied simply because they cannot satisfy their "expensive tastes." In political philosophy, the idea of taking subjective satisfaction as the metric of advantage is quite unpopular, although most authors wrongly consider that subjective satisfaction is the only possible measure if one wants to respect individual preferences. Those who reject subjective satisfaction therefore also argue against taking account of individual preferences (e.g., Hausman, 2011), on the ground that individual preferences often fail to track what is truly good for individuals. The obvious question is then to ask who is better able than the individual to decide what is good for her, and in this paper I will stick to the idea that there is some form of authentic preference that is worth respecting.

For the sake of exhaustivity, it should be mentioned that subjective well-being studies also look at hedonic scores, which are based on emotions rather than cognitive evaluations of satisfaction. Hedonic scores are interesting but less promising than satisfaction at the bar of the criteria used in this paper. Emotions are imperfectly linked to objective conditions, and therefore fail to provide comprehensive measures of people's situations, and fail to track the correlation of (dis)advantages. Focusing on hedonic scores, as a measure of advantage, respects the preferences of pure hedonists, but is paternalistic toward people who seek other things in life than experiencing pleasant feelings. Fairness is also hard to invoke as an argument in favor of hedonism, because there are no prominent conceptions of justice that argue for hedonism understood in the narrow sense of emotional flows. The existing hedonic approaches (e.g., Sumner, 1996; Feldman, 2010) are actually closer to experiential conceptions of satisfaction.

In conclusion, subjective well-being studies do not provide a ready-to-go measure of advantage that would nicely fit the criteria proposed here. This is unfortunate because they are so cheap to implement. One can perhaps hope for the development of new questions that would eliminate the noise that plagues the current questions. But it should warned that this is no simple task. Indeed, the noise comes from respondents using the scales in different ways. However, for respondents with different preferences, trying to make them use the scales in the same way is a non-starter. That is just impossible, because their rankings of life situations are different. A banker and an athlete cannot use the scales in the same way, because they put different weights on various aspects of life.

One could object to this warning that perhaps people construct their answer to a satisfaction question in two stages. First, they determine what their current level of well-being is, taking account of the different weights they put on various aspects. Second, they transform their genuine well-being level into a number or category that fits the demands of the questionnaire. In this two-stage story, one could indeed hope to eliminate heterogeneity in the second stage, while keeping the first stage able to accommodate a diversity of preferences. The problem with this story is that it assumes that there is a magnitude called "genuine well-being." It is doubtful that there is such a thing. When people answer a satisfaction question, they directly leap from their multidimensional situation to a number or category on a scale. It is most unlikely that they would first construct a well-being index that would be interpersonally comparable.

The idea that they don't produce such an intermediate index is not just an empirical hypothesis. The deeper reason is that it would be an extraordinary coincidence if this intermediate index coincided with the appropriate index that the social observer wants to compute. Making relevant interpersonal comparisons of people with different preferences is intimately linked to defining fairness principles determining who is better off. Eliciting such interpersonal comparisons by smart questionnaires involves not only eliminating some noise, but also asking questions that directly target the relevant magnitudes based on the appropriate fairness concepts. Equivalent income provides a clear example. If one believes that this is the relevant measure, there is no hope of obtaining it with a simple satisfaction question. Only a specific "equivalent income" question could possibly deliver the right answers directly. If a direct question appears impossible to ask because it is too demanding cognitively, then one must devise indirect methods. There goes the hope for simple direct measures of well-being.

Again, let us illustrate this issue of comparisons by looking at how one could use a satisfaction equation like the one introduced earlier in this section. Even if one cleans the total score S_i by retaining only the relevant part $\hat{S}_i = \alpha \ln y_i + \sum_s \beta_s q_{is} + \sum_{s,k} \delta_{sk} q_{is} z_{ik}$ (assuming that the remainder of the equation, in particular ε_i, contains no interesting information), the interpersonal comparisons made with $\hat{S}_i$ may not be the correct ones. It is indeed possible to have $\hat{S}_i > \hat{S}_j$ and $y_i^* < y_j^*$ at the same time, because the preference shifters $\delta_{sk} z_{ik}$ have a different level impact on

$$\alpha \ln y_i + \sum_s \beta_s q_{is} + \sum_{s,k} \delta_{sk} q_{is} z_{ik}$$

and on

$$y_i \prod_s e^{\left(\beta_s + \sum_k \delta_{sk} z_{ik}\right)\left(q_{is} - q_s^*\right)}.$$

Getting the interpersonal comparisons right involves not just eliminating some irrelevant terms in the S_i equation, but transforming the variables so as to obtain desired properties such as the fact that for individuals enjoying $q_i = q^*$, interpersonal comparisons in terms of y_i are correct. This property is guaranteed only with y_i^*, not with $\hat{S}_i$.

5. Intrinsic and Instrumental Values

Income and wealth have been criticized in the introduction (echoing widespread criticism in current debates) for failing to be sufficiently comprehensive. But the discussion so far has revealed another disturbing aspect, which also perhaps contributes to the fact that many stakeholders, especially those who are not economists, dislike the reference to monetary magnitudes. Income and wealth are specific aspects of individual situations which are not fundamental. People are interested in income and wealth instrumentally, not fundamentally. Those who are interested in monetary success for its own sake should probably consult a psychiatrist. Even the most materialistic businessmen are not after big numbers on their bank account as such. They seek social success, the possibility to enter exclusive social circles and to have certain luxury consumptions. Perhaps they even just enjoy the competition and the failure of their competitors. None of that is praiseworthy, of course, but it belongs to the list of ordinary human goals. Money, in contrast, is not a fundamental human goal.

As is well known, economic models are frustrating because they only need to describe preferences about market activities (goods and services), whereas everyone knows that people's desires are deeper and broader. There have been attempts at a deeper modeling of preferences. Lancaster (1966) has proposed to refer to "characteristics" defined as the properties of goods and services that really matter to people. Sen (1985) has introduced preferences over functionings in his model of capabilities. Let us here follow their lead and explicitly describe what people care about fundamentally, and relate this to measures of well-being.

Consider an abstract space L of the dimensions of life that people really care about, intrinsically. One may think that, prominent among these dimensions, one finds healthy bodily and mental functions; good social status and enjoyable social relations (including with non-human beings); a set of activities and cognitive states related to knowledge, discovery and wisdom; the search for achievement and even perfection in activities transforming the world, or preserving it; finding one's place in a lineage and ensuring continuation through natural or otherwise descendants; finding meaning in one's life and carving one's place in some perceived social or cosmic order. There are many variations between people with respect to how these abstract dimensions are connected to concrete states and actions, and their relative value and importance (some may like dominating other beings, others may prefer respectful and equal relations; some may yearn for discovery, others may prefer the comfort of tradition). But it is assumed here that these dimensions can be given a non-ambiguous meaning.

Let $l_i \in L$ be the life vector of individual i, described in this space. It is assumed that L is the space that people really care about. Intrinsic values are attached to l_i. Let $\succeq_i$ denote i's preference ordering over L.

Then there is a more concrete space X of states and actions that includes production and consumption of various goods and services, as well as some internal characteristics and functionings. This space X may overlap with L. The defining characteristic of this space is that it includes market and non-market activities on resources, and whatever else is needed to determine the individual's possibilities in L. While the dimensions of L have intrinsic value, most of the

dimensions of X only have instrumental value. Let $x_i \in X$ describe the vector of activities and other variables in i's life in terms of X space. A subset x_i^m of components of x_i takes places in the market, and the related unit prices are denoted p_i. They are potentially individual specific (as seen in the subscript i) because the market may be segmented, or include bargained trades with local prices.

There is a transformation function that maps x_i into l_i: $l_i = f(x_i, \succeq_i)$. This function is best thought of as resulting from an optimization. That is, there may be several ways of transforming x_i into a vector in L, and l_i is the vector that is the best according to $\succeq_i$. But if individuals are not fully rational, this optimization may not always be an accurate description of what is happening. Here we only need a well defined function f linking the two spaces. It is important for the present analysis that f is a general "technology," and is not individual specific. All characteristics that are specific to i should appear either in x_i, as characteristics of i's external and internal situation, or in $\succeq_i$, which explains how i's goals make her use any given x_i.

One can then derive preferences R_i over X from the more fundamental preferences over L:

$$x_i R_i x_i' \Leftrightarrow f(x_i, \succeq_i) \succeq_i f(x_i', \succeq_i).$$

One can view R_i as the usual economic preference ordering over goods and services (and a few other things) that economists are familiar with. The values it attaches to x_i are mostly instrumental, and come from the production of more fundamental values in space L by the transformation function f_i.

Once preferences over goods and services are defined, one can make income and wealth appear in indirect preferences, in the usual way. Recall that $x_i = (x_i^m, q_i)$, where $x_i^m \in X^m$ refers to marketed goods and services (in the market subspace X^m), and q_i to the other components of x_i (non-market goods and services, some personal characteristics). One can define indirect preferences $\hat{R}_i$ on vectors (y_i, p_i, q_i), which are the vectors (x_i^m, q_i) where x_i^m is replaced by the income(or wealth)–price pair (y_i, p_i). Such indirect preferences are defined as follows: $(y_i, p_i, q_i) \hat{R}_i (y_i', p_i', q_i')$ if the best vector (x_i^m, q_i) that is affordable from (y_i, p_i, q_i) is weakly preferred according to R_i to every $(x_i'^m, q_i')$ that is affordable from (y_i', p_i', q_i'):

$$
\begin{aligned}
(y_i, p_i, q_i) \hat{R}_i (y_i', p_i', q_i') \Leftrightarrow & \exists x_i^m \in \{z \in X^m \mid p_i z \le y_i\}, \\
& \forall x_i'^m \in \{z \in X^m \mid p_i' z \le y_i'\}, (x_i^m, q_i) R_i (x_i'^m, q_i') \\
\Leftrightarrow & \exists x_i^m \in \{z \in X^m \mid p_i z \le y_i\}, \\
& \forall x_i'^m \in \{z \in X^m \mid p_i' z \le y_i'\}, \\
& f(x_i^m, q_i, \succeq_i) \succeq_i f(x_i'^m, q_i', \succeq_i).
\end{aligned}
$$

The second equivalence directly relates to the fundamental ordering $\succeq_i$ rather than the "instrumental" ordering R_i, by making use of the f mapping.

This simple model is helpful in making a few interesting points very clear about the importance of respecting preferences. First, it may seem that respecting preferences R_i on goods and services (and a few other things), or preferences

$\hat{R}_i$ over budget sets (and a few other things) is somewhat down-to-earth because such things are trivial compared to what really matters to people in their life. But the definitions of R_i and $\hat{R}_i$ show that they directly reflect the impact of what happens in the instrumental space X on what happens in the intrinsically valuable space L. For instance, failing to respect preferences over working hours or over transportation mode may against more fundamental values that matter to the individuals. Likewise, using price deflators that do not reflect the diversity of preferences in the population is potentially quite damaging in terms of misrepresentation of how the population is really doing in terms of well-being.

In a similar vein, the skepticism of many non-economists about monetary magnitudes is in part based on a misunderstanding of the fact that even if monetary magnitudes have an instrumental value, they serve higher purposes that have intrinsic values to individuals. However, the close link between the orderings $\succeq_i$ and $\hat{R}_i$ is not enough to justify comparing individual situations with monetary measures; more will be said about this in the next section.

Moreover, the link between the preferences on various spaces is important to lay out explicitly and has non-trivial implications, in particular for the application of the same-preference principle. The following propositions can be viewed as giving a warning against confusing the different spaces, but the second one can also be viewed as a positive message for measures that satisfy the same-preference principle in the space of instrumental variables, such as the equivalent income.

Proposition 1. *Two individuals sharing the same $\succeq$ on L necessarily have the same R on X and the same $\hat{R}$ on the set of (y, p, q). But the converse is not true: two individuals sharing the same R (and therefore the same $\hat{R}$) need not have the same $\succeq$.*

Proof. *Let i and j be such that $\succeq_i = \succeq_j$. One has*

$$xR_i x' \Leftrightarrow f(x, \succeq_i) \succeq_i f(x', \succeq_i)$$
$$\Leftrightarrow f(x, \succeq_j) \succeq_j f(x', \succeq_j)$$
$$\Leftrightarrow xR_j x'.$$

The equality $\hat{R}_i = \hat{R}_j$ immediately follows.

For the converse, consider the following example. There are two dimensions in L, comfort and wisdom. Individual i only cares about comfort, individual j only cares about wisdom. The production functions of comfort and wisdom out of commodities are the same. This implies that i maximizing comfort has preferences over commodities which are identical to those of j maximizing wisdom. ∎

The example in the proof is simple and direct but not very realistic. However, one can imagine more plausible cases where a different combination of intrinsic values requires the same mix of instrumental means. For instance, achieving a productive intellectual career may require a similar lifestyle as a productive artistic career. People can be vegetarian, or have no children, for very different reasons. This shows that identical preferences in the space of instrumental means does not

necessarily mean anything deep about people's goals in life. The same-preference principle must therefore be taken with caution.

Proposition 2. *A measure that satisfies the same-preference principle with respect to $\succeq$ on L (i.e., the measure agrees with the common ranking made about their two situations by two individuals sharing the same $\succeq$) does not necessarily satisfy the same-preference principle with respect to R on X (or with respect to $\hat{R}$ on the set of (y, p, q)). However, the converse holds: A measure that satisfies the same-preference principle with respect to R on X (or with respect to $\hat{R}$ on the set of (y, p, q)) necessarily satisfies the same-preference principle with respect to $\succeq$ on L.*

Proof. *Consider a measure that uses the equivalence method in the L space: there is a monotone path $P \subset L$ such that i is better off than j according to the measure if $l_i^* > l_j^*$, where $l_i^*, l_j^* \in P$, $l_i \sim_i l_i^*$ and $l_j \sim_j l_j^*$. Consider two individuals i, j who have the same $R_i = R_j$ but not the same $\succeq_i, \succeq_j$. If $x_i = x_j$, one obviously has $x_i I_i x_j$ and $x_i I_j x_j$, but not necessarily $l_i^* = l_j^*$ for $l_i^*, l_j^* \in P$, $f(x_i, \succeq_i) \sim_i l_i^*$ and $f(x_j, \succeq_j) \sim_j l_j^*$.*

To make the example fully specified, let L have two dimensions, $\succeq_i$ focuses exclusively on dimension 1 and $\succeq_j$ on dimension 2. Let $P = \{l \in L | l^1 = l^2\}$. Let X also have two dimensions, and $f(x, \succeq_i) = (x^1 + x^2, 0)$, $f(x, \succeq_j) = (0, 2(x^1 + x^2))$. One sees that $R_1 = R_2$, both orderings maximizing $x^1 + x^2$. But when $x_i = x_j$, one has $l_i = (x_i^1 + x_j^2, 0)$, implying $l_i^* = (x_i^1 + x_j^2, x_i^1 + x_j^2)$, whereas $l_j = (0, 2(x^1 + x^2))$, so that $l_j^* = (2(x^1 + x^2), 2(x^1 + x^2))$. As $l_j^* = 2l_i^*$, the measure does not deem i and j equally well off, contradicting the same-preference principle in X.

For the converse, let i and j have the same $\succeq_i = \succeq_j$ and let i be on a higher indifference curve than j in L (or the same indifference curve):

$$f(x_i, \succeq_i) \succeq_i f(x_j, \succeq_j) \Leftrightarrow f(x_i, \succeq_i) \succeq_j f(x_j, \succeq_j).$$

By definition, $R_i = R_j$, and moreover, one then necessarily has $x_i R_i x_j$ and $x_i R_j x_j$. A measure satisfying the same-preference principle in X will deem i at least as well off as j, and this is precisely what the same-preference principle in L requires. ∎

This proposition casts doubts on the ethical force of the same-preference principle applied to the space of instrumental values, but at the same time, if one strongly believes in this principle applied in *L*, it is comforting to know that it is necessarily satisfied by a measure like equivalent income that respects it in the space of budgets and similar resources. The same-preference principle in instrumental spaces appears less compelling, but still a nice guarantee of satisfying it for intrinsic values.

The second point that is made clear by this model is how limiting an exclusive focus on (y_i, p_i) is when there are other arguments q_i in the link between $\succeq_i$ and $\hat{R}_i$. For instance, if social status (in q_i) is important in people's eyes, analyzing the well-being of the unemployed in terms of real income only is missing an important

part of the picture. Similarly, if there is a handicap in q_i that prevents i from using x_i^m fully, it is potentially a big mistake to compare individuals in terms of budgets only.

This problem with an exclusive focus on external and marketed resources carries over whenever some dimensions of q are ignored in the analysis, for example because they are not observable. One individual may be richer in terms of (y_i, p_i, q_i^o) but poorer in terms of (y_i, p_i, q_i), where q_i^o denotes the observed subvector of q_i.

Moreover, when dimensions of q are ignored in the analysis, then the link between $\succeq$ on L and the preferences over observed dimensions becomes very loose. The above propositions no longer hold. Identical preferences $\succeq$ on L no longer imply identical preferences over (truncated) x. And the satisfaction of the same-preference principle with respect to R on (truncated) x no longer guarantees that the same-preference principle is satisfied with respect to $\succeq$ on L. What can happen, indeed, is that two individuals with identical preferences over resources are clearly ranked in terms of observed living standards but are inversely ranked in terms of well-being in L due to the unobserved characteristics in q.

These observations should not be taken to mean that nothing should be done until a full and complete observation of all relevant dimensions can be achieved. Rather, it means that one should always be cautious both about the ethical value of the same-preference principle and about the interpersonal comparisons that are made with a subset of dimensions. Most importantly, this opens the way to research on the sensitiveness of conclusions about social welfare, inequalities and poverty to the list of dimensions that are included in the analysis. The optimistic view is that with the dimensions currently made accessible with standard surveys on living conditions, one has enough to get a reasonably accurate picture about the distribution of advantage and disadvantage in the population. The pessimistic view is that the most unobservable characteristics may matter a lot. This could connect to the debate on personal responsibility. Suppose that a behavioral characteristic that is very important in sociability and social success is very hard to observe and often leads to misattribution of personal responsibility for failure to the victims of this characteristic. It may then be very hard to get an accurate evaluation of the distribution.

6. The Locus of Fairness

The third lesson that this model makes clear is that interpersonal comparisons, if made on the basis of fairness considerations, need to be made with indicators that belong to the space that is defined by these fairness considerations. It is in particular possible that fairness principles operate in a space of instrumental values. In a Rawlsian approach that divides labor between society and individuals by requiring the former to distribute means and resources and letting the latter assume responsibility for the personal goals that govern their use of means and resources, it is indeed appropriate to compare individuals in terms of means, even if such means only have instrumental value in people's pursuit of personal goals in life.

The approaches discussed in this paper can be described easily in this model, and each defines interpersonal comparisons in a different space. Equivalent income can be computed as the solution to the indifference condition:

$$(y_i, p_i, q_i) \hat{I}_i(y_i^*, p^*, q^*),$$

where p^*, q^* are reference parameters. The variant that lets individuals optimize q^* is defined by the condition:

$$(y_i, p_i, q_i) \hat{I}_i(y_i^*, p^*, q_i^*) \text{ and } \forall q, (y_i, p_i, q_i) \hat{R}_i(y_i^*, p^*, q).$$

The underlying fairness principle is that individuals who have greater income when enjoying p^* and q^* (or q_i^*, in the variant) are better off than those with less income. The space of fairness is the space of budgets, combined with the additional variables q. These additional variables play a key role, as illustrated with the unemployment example earlier. Another important example is when a personal disability makes it harder to make use of a budget in order to obtain a good life in L. Such a disadvantageous q_i implies a lower y_i^*, because when q_i is worse than q^* (or q_i^*), the individual is willing to have a lower y_i^* combined with q^* (or q_i^*) and still reach the current satisfaction.

The capability approach can be described as identifying the space of valuable functionings as L, and defining personal capabilities as the subset $C_i \subset L$ of lives l_i that are accessible to the individual. For this notion to become operational, one may want, as suggested by Sen (1985), to define the set of resources (and a few other things) $Q_i \subset X$ that is accessible to i as well as the set Γ_i of orderings $\succeq$ of L that are accessible to i. One then has:

$$C_i = \{l \in L | \exists x \in Q_i, \succeq \in \Gamma_i, l = f(x, \succeq)\}.$$

One sees that this approach puts a heavy weight on the notion of accessibility in order to delineate the capability set. Note that this formalism slightly differs from Sen (1985, p. 13), because he defines the capability set in a way that singles out commodities:

$$C_i = \{l \in L | \exists x^m \in B_i, \phi \in F_i, l = \phi(x^m)\},$$

which invokes a resource (e.g., budget) set B_i and a set F_i of accessible transformation functions $\varphi : X^m \to L$. The difference between the two models is important for the following reason. Differences in personal characteristics that help an individual transform external resources into functionings are put by Sen in the F_i set, whereas here they appear in the q subvector of x, therefore in Q_i. In the present model, the compensation of disabilities happens within Q_i, with some external resources compensating for some internal characteristics, whereas in Sen's model, disabilities are represented in F_i and compensation can be done through B_i.

As described here, the definition of C_i does not say how these sets should be compared across individuals. There is a literature on the comparison of individual sets, most of which does not rely on individual preferences. One can say that it has not been very conclusive, and has not inspired many applications.[2] There is also a literature on equality of opportunities that does provide some more concrete ways of implementing the capability idea. It gives more structure to the model by distinguishing the personal characteristics for which individuals are held responsible and the personal circumstances for which compensation is sought. Fleurbaey and Blanchet (2013) provide suggestions about how to link the capability approach to this equality of opportunity literature.

The third approach discussed in this paper is the satisfaction approach. It can be described as using whatever cardinalization of $\succeq_i$ the individual is improvising when answering the satisfaction question. As explained in the previous section, it is hard to find a fairness approach that defends such a measure. In fact, its main characteristic is that it does not rely on any sensible fairness principle and just lets individuals fill the void by providing a spontaneous answer in the given scale of the question.

The picture that emerges from this section is that fairness considerations are the key ingredient in the determination of interpersonal comparisons. It is a pity that the literature on well-being most often focuses on the measurement of well-being as if it were primarily an empirical issue. But for the purpose of social evaluation, well-being is not an empirical concept. It is primarily a fairness concept that needs empirical data but is driven by ethical principles. No survey on well-being will tell us if equivalent income is a good measure or not. Data can only tell us whether it can be measured reliably.

One question relating this section to the previous one must be raised. Fairness considerations can reasonably bear on instrumental variables if the underlying theory of justice leaves it to individuals to assume responsibility for their use of instruments and means. But with such a theory, in what space is the same-preference principle the most relevant? It was implicitly assumed in the previous section that the space of intrinsic values L was the place of choice for the application of the same-preference principle. But this is not totally obvious if fairness bears on means and resources. After all, when interpersonal comparisons are made in the space of means, respecting individual preferences on means, shouldn't interpersonal comparisons *of means* (rather than a deeper well-being) made by individuals with identical preferences *on means* have ethical force?

7. WHITHER WELL-BEING?

The journey outside the realm of income and wealth if full of charming sights and frightening pitfalls. This paper has argued for a certain dose of intellectual conservatism. That is, income and wealth have virtues, for interpersonal comparisons, which should not be forgotten when venturing into the domain of

[2]The empirical literature on capabilities is of course huge, but usually capabilities are proxied by functionings such as education, health, and income.

non-market goods and services and relevant personal characteristics. The four criteria that have been proposed in this paper for the selection of reasonable measures (comprehensive, correlation sensitive, preference-based, fairness-based) firmly push beyond the narrow monetary measures but are not favorable to radical moves such as embracing completely subjective measures of satisfaction.

The main issue, that remains hard to convey to the economics profession, was already the key message of Robbins (1937), usefully clarified later in Robbins (1981). Interpersonal comparisons are primarily a matter of fairness. This does not mean that economists should shy away from the topic, as has been misunderstood by many and for a long time. On the contrary, economics is uniquely equipped to analyze these notions.

In particular, combining relevant fairness considerations with the core economic principle of respecting individual preferences is a nice challenge, and this question provided much of the substance of this paper. It suggests moving from income to equivalent income, and raises deep issues due the fact that the space of fairness may not coincide with the space of intrinsic values, that is, the things that people really care about. Economic concepts are mostly developed for the analysis of resources, and this may be fortunate if this is also a key domain for fairness principles. But we also would like to respect the true and deep goals of people in life, rather than fetishizing resources and money. This tension, analyzed in the last two sections of this paper, is likely to stay with us and underlie the future development of alternative measures of living standards and well-being.

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